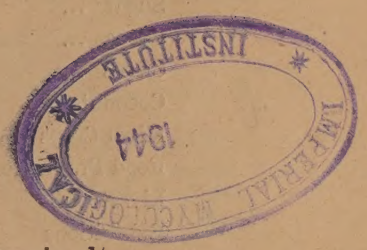
TRINIDAD AND TOBAGO.

Council Paper No. 57 of 1943.

AGRICULTURE



Administration Report of the Director of Agriculture for the year 1942.

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TRINIDAD AND TOBAGO.
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REPORT OF THE DEPARTMENT OF AGRICULTURE FOR THE YEAR 1942.

CONTENTS.

	Page.
Agricultural Policy	3
Part I—Agriculture in 1942.	
Sugar	4
Cocoa	4
Citrus	5
Coconuts	5
Minor Crops	5
Food Production	5
Livestock	6
Exhibitions	6
Part II—Departmental Institutions, District Work, Experimental Work and Specialists' Reports.	
Departmental Institutions.	
Staff	7
River Estate	7
St. Augustine Nursery	7
St. Augustine Experiment Station	7
Royal Botanic Gardens and Government Grounds	8
Development Planting Schemes	8
Government Stock Farm and Animal Husbandry	9
District Work.	
Duties of District Staff	10
Land Settlements	10
Marketing and Co-operation	10
Agricultural Credit Societies	10
Agricultural Co-operative Societies	11
Government Co-operative Cacao Fermentaries	11
Experimental Work.	
Sugar Agronomy	11
Cacao Agronomy	12
Citrus	12
Miscellaneous Crop Investigations	13
Specialist Reports.	
Plant Pests	13
Plant Diseases	13
Soil Survey	14
Veterinary	14
Imperial College of Tropical Agriculture	15
Visits of Comptroller for Development and Welfare and Inspector-General of Agriculture	15
Publications	15
Agricultural Legislation	16

AGRICULTURE.

Administration Report of the Director of Agriculture for the year 1942.

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AGRICULTURAL POLICY.

Close consideration has been given during the year to the agricultural policy of the Colony. On the 2nd June a committee under the Chairmanship of Mr. A. J. Wakefield, C.M.G., Inspector-General of Agriculture and comprising the Honourable E. V. Wharton, C.B.E., the Honourable George de Nobriga, the Honourable Sarran Teelucksingh, the Honourable A. C. Rienzi, Captain W. F. Watson, O.B.E., Mr. H. E. Robinson, Mr. R. O. Williams, Acting Director of Agriculture and Mr. C. C. Skeete, Secretary, was appointed by His Excellency the Acting Governor with the following terms of reference :—

(1) To define the objectives of a policy for agricultural development in Trinidad and Tobago ;

(2) to formulate a long-term policy for such agricultural development ;

(3) to lay down the broad lines of experiment and research programmes ;

(4) to suggest the means required for the dissemination to producers of the results of research and methods for agricultural advance ;

(5) to make proposals for the closer co-operation between producers and their organisations with Government, especially in regard to research, extension services and marketing ;

(6) to review the relationship of the Government services or Government appointed bodies which are now concerned with agriculture, and to submit proposals for their development or improvement ;

(7) to examine the structure and establishment of the Department of Agriculture in relation to the proposed policy and programmes for future work and to submit such recommendations in regard to staff, organisation and other facilities as may be necessary to enable the Department to carry out the agricultural policy proposed for the future.

2. The examination of the terms of reference 1, 2, 4, 5 and 6 which forms Part I of the Committee's Report was almost complete at the end of the year.

I.—AGRICULTURE IN 1942.

3. The Colony's agricultural exports for the year 1942 were valued at $7,941,535 a decline of $2,355,896 as compared with those for 1941. This is attributable primarily to substantial decreases in sugar and cocoa production. The demand for labour and transport for essential war services had a serious effect on the production of export crops throughout the Colony but despite these difficulties it is possible to record very appreciable increases in the production of rice and other foodstuffs for local consumption. The details of exports are given below :—

		Quantity.	*Value.* $	*Value.* $
Sugar and Bye-products :				
Sugar	*tons*	84,670	5,296,876	
Molasses	*gal.*	1,424,256	105,922	
Rum	*gal.*	228,606	192,233	5,595,031
Cocoa.				
Raw Cocoa	*lb.*	10,107,730	1,187,994	
Cocoa Butter	*lb.*	2,042	661	1,188,655
Citrus :				
Lime oil—Distilled	*lb.*	41,039	319,392	
Lime oil—Hand pressed	*lb.*	461	3,202	
Raw Lime Juice	*gal.*	46,249	21,392	
Limes—Fresh	*lb.*	9,421	622	
Citrate of Lime	*lb.*	334,666	34,070	
Fresh Grapefruit	*No.*	327,933	7,995	
Fresh Oranges	*No.*	1,360,325	16,025	
Canned Grapefruit juice	*gal.*	96,315	64,258	466,956
Tonca Beans	*lb.*	182,377	231,015	231,015
Rubber—Raw	*lb.*	157,950	55,602	55,602
Coffee :				
Raw Coffee	*lb.*	251,290	33,646	
Prepared Coffee	*lb.*	42,908	9,474	43,120
Coconut Products :				
Copra	*lb.*	87,920	3,864	
Margarine	*lb.*	60	18	
Edible Oil	*gal.*	22,510	17,958	
Lard Substitute	*lb.*	2,636	278	22,118
Bananas :	*stems*	724	1,107	1,107
Peas and Beans :	*lb.*	900	55	55
Livestock and Hides :				
Livestock	—	—	3,341	
Hides	*lb.*	406,470	31,738	35,079
Bitters :	*gal.*	37,900	251,117	251,117
Honey :	*lb.*	28,941	3,521	3,521
Miscellaneous :		—	48,159	48,159
Total Value of Exports				$7,941,535

4. The rainfall in representative localities of the colony for 1942 was as follows :—Diego Martin, River Estate 86.45 inches; St. Joseph, Government Stock Farm 73.33 inches ; Couva, Brechin Castle Estate 63.27 inches ; Montserrat, Police Station 76.00 inches; Naparima, Usine Ste. Madeleine Estate 70.77 inches ; Siparia, Police Station 65.03 inches ; Cedros, Perseverance Estate 49.59 inches ; Sangre Grande, Grosvenor Estate 98.81 inches ; Toco, Police Station 72.00 inches ; Tobago, Botanic Station 77.10 inches.

SUGAR.

5. *Production.*—Production of sugar amounted to 104,377 tons as compared with 131,609 in the previous year. During the year under review 84,670 tons were exported and 19,198 tons sold locally. A total of 985,394 tons of canes were ground by all factories ; 535,849 tons being grown by estates and 449,545 by farmers, this compares with 684,775 grown by estates and 528,516 by farmers in the previous year.

6. It is estimated that 3,886 acres of estates' canes (78,000 tons) were left unreaped and approximately 10,000 tons of farmers' canes due to the shortage of labour supply; for the same reasons yields were reduced through the lowering of standards of cultivation and the area replanted was estimated at 4,729 acres or 59 per cent. of normal.

7. Insect pests remained at the unusually high level which has been maintained since 1929 ; froghopper attacks were even more widespread than in 1941 and there was severe damage caused by leaf-eating caterpillars. The loss of cane from these two causes is estimated to reduce the tonnage of canes due for reaping in 1943 by 147,000 tons. There was a shortage of supply of pyrethrum for control of this pest by powder dusting, but one estate greatly reduced the damage by the use of available supplies.

8. The production of foodstuffs by estates and farmers in place of canes, the lowered standard of cane cultivation due to lack of labour, adverse weather and insect damage, are likely to further reduce the output of sugar in 1943. The planting of food crops and limitation in the use of fertilizers for canes must almost certainly cause a further reduction in 1944.

9. *Prices of Canes and Sugar.*—All sugar for export was purchased by the Ministry of Food at a price of 12/9 per cwt., f.o.b., this included an increase of 1/1½d. per cwt. which was granted to meet increased costs of labour and operating expenses. Sugar for local consumption realised $4.25, per 100 lb. for washed greys, $4.50 for yellow and grey crystals, $5.40 for estate whites and $7.25 for granulated sugar. These prices included levies of 1c per lb. on all sugars other than granulated and 2c per lb. on granulated. The levies were paid into a sugar reserve pool by manufacturers.

10. The price of canes which is arrived at by a formula in the Third Schedule of the Cane Farming Control Ordinance, Chapter 23, No. 12, was determined at $4.26 per ton. After a detailed examination of the cost of manufacturing sugar in 1942, it was found that 48c. had been overpaid to farmers. This was repaid to manufacturers from the Sugar Reserve Pool, and a further 24c. per ton paid to farmers for canes delivered and 23.5c. per ton to estates. The price of farmers' canes was then $4.50 per ton.

11. *Field Investigation.*—The field investigation work of the Sugar Cane Investigation Committee continued to give information of immediate economic value as to manures, cultural measures and varieties. The new varieties B.34104 and B.3439 are continuing to replace the standard varieties previously in use. Another variety B.3337 is showing great promise. Detailed field to field surveys of soil types and contour ploughing demonstrations were undertaken.

COCOA.

12. *Production.*—The crop was the poorest on record in the history of the industry. The cumulative effect of low yields and low prices, the toll taken by Witches' Broom and the shortage of labour of the last two years has been the cause of a rapid decline of this industry in Trinidad.

13. *Witches' Broom.*—In Tobago Witches' Broom disease is still not severe and control work is being maintained. In Trinidad experiments have been undertaken on behalf of the Cacao Board in consultation with the Imperial College of Tropical Agriculture, but no effective control was achieved under the conditions of these experiments which are explained in paragraph 172.

14. Some of the introductions of seedling cacao made in 1938 from the Amazon Valley continue to show resistance to Witches' Broom and Government approved of a further expedition to Peru to prepare budded plants from the original trees. Dr. F. J. Pound, Cacao Agronomist, left in September on this mission.

15. *Rehabilitation of the Cacao Industry.*—The Scheme for the Rehabilitation of the Cacao Industry (Council Paper No. 61 of 1940) was suspended, and the cess already collected refunded by Order No. 1 of 1942, until cacao cuttings were available for distribution and results of experiments to be conducted on mixed farming were ascertained. The part of the Scheme dealing with the substitution of cacao by other crop plants on suitable lands was brought into operation.

16. The construction of the Propagating Station at La Pastora was almost completed during the year and progress was made on the King's Bay Station, Tobago.

17. *Price and Destination of Crop.*—A price of $12.25 per fanega for Plantation grade cacao with lower prices for other grades, prevailed on the local market throughout the year. All sales to export markets were made through licensed exporters who retained their actual expenses of overhead and direct charges and in addition 50c. per fanega as remuneration for their services. The difference between the prices realised and those paid on the local market, after deducting the charges referred to above was paid to the Accountant-General for distribution to growers.

18. There was a quota of 1,650 tons for the United Kingdom (1,744 tons were actually shipped) which merchants were required to ship before export licences were granted for shipment elsewhere.

CITRUS.

Grapefruit and Oranges.

19. The citrus crop was normal and the Citrus Growers' Association handled 115,306 crates of grapefruit and 4,851 crates of oranges. The bulk of the grapefruit crop was again turned into canned juice of which 65,056 cases were sold locally and 31,970 were exported. The local demand was so great that in July, 1942, the Food Controller suspended the issue of export licences for canned juice. This was later relaxed to allow of exportation of limited quantities to the British West Indies.

20. The area under grapefruit and oranges was somewhat reduced as a result of land acquisition and lack of attention to cultivation.

Limes and Lime Products.

21. There was a considerable decline in the quantity of lime oil exported due chiefly to smaller carry-over stocks. Prices were higher and exports totalled 41,500 lb. lime oil. Only small quantities of lime juice and citrate of lime were exported on account of shipping difficulties.

22. The area under limes was appreciably decreased as a result of disease and land acquisition.

COCONUTS.

23. The coconut crop was fair and produced 20,504,705 lb. copra from which 1,732,074 gallons raw coconut oil were manufactured. A small quantity of coconut products was shipped to other British West Indian Islands.

24. Most plantations experienced labour difficulties and there was some loss of nuts due to inadequate labour supply.

25. Coconut products manufactured were as follows :—

Margarine	406,699 lb.
Edible Oil	919,524 gal.
Lard Substitute	1,201,848 lb.
Raw Oil (consumed locally)	99,866 gal.
Raw Oil (used in laundry soap)	173,100 gal.

26. The legislation prohibiting exports of coconuts, copra and copra products passed in 1941 was amended during the year to allow of exports of deodorised edible oil to neighbouring British Colonies under permit.

27. The price of copra was fixed at $4.00 per 100 lb.

MINOR CROPS.

Rubber.

28. Rubber production increased from 147,588 lb. in 1941 to 157,950 lb. in 1942.

29. A Rubber Survey undertaken by the Department disclosed the number of Rubber trees in the Colony to be 185,298 Hevea and 71,937 Castilloa.

30. In August, 1942, the Rubber Reserve Corporation of the United States of America entered into an agreement with the Government to purchase all local rubber at a price of 48c. (U.S.) per lb., f.o.b., for first quality Hevea smoked sheets, and appropriate differentials for other grades.

Tonca Beans.

31. Exports of Tonca Beans increased considerably from 82,599 lb. in 1941 to 182,377 in 1942. The crop was excellent but prices were low. Shipments were on consignment only and the greater part of the crop was still unsold at the end of the year.

Coffee.

32. Owing to a severe shortage of reapers much of the coffee crop, a normal one, went unreaped. Exports declined about 80 per cent. as compared with 1941 and in order to safeguard supplies for the local market the question of prohibiting further exports was under consideration at the end of the year.

FOOD PRODUCTION.

33. A shortage of food imports in the early months of the year as a result of enemy action gave a much needed impetus to food production, which after a good start early in the war had declined in 1941. Recommendations for increasing the production of foodstuffs were made to Government early in March, a Food Controller was appointed soon afterwards when many of these were put into effect. Local production was placed in charge of an Officer in Charge of Local Production, Mr. Harold Fahey, and Marketing under an Officer in Charge of Marketing, Mr. A. E. Trotman, who was seconded from the Department of Agriculture.

34. This Department continued to take very active steps in all matters connected with Food Production and Marketing and worked in close collaboration with the Food Controller's organisation. Large areas of land were given out by the latter as War Gardens. Many lectures and demonstrations were given throughout the countryside, a further series of seventeen radio talks were arranged with assistance of many kind unofficial helpers, a refresher course on gardening was given to 40 teachers of the elementary schools, and frequent contributions made to the press. The proper utilization of local foods, as well as their cultivation was stressed throughout.

35. Seeds and other planting material were made available from the St. Augustine Nursery and a considerable area of foodstuffs was planted on the Experimental Station.

36. The Cacao Board subsidized the cutting out of 1,984 acres of derelict cacao at the rate of $10.00 per acre and 2,892 acres of foodstuffs were grown on sugar estates. The total new acreage planted throughout the island was estimated by the Food Production Officer as 10,218 acres.

37. The position with regard to the more important classes of foodstuffs is, as follows :—

Rice.—The acreage under this crop was estimated at 11,625 acres, swamp rice and 350 acres hill rice with a yield of 9,450 tons, as compared with 10,925 acres yielding 8,000 tons in the previous year and 6,000 tons pre-war. The weather was particularly favourable.

Corn (Maize).—An increase in the area planted is recorded from all districts. A part of the crop used in the green stage proved very useful in the period of shortage. In the Oropouche Lagoon alone 1,100 acres were planted, 400 more than in the previous year.

Black-Eye Peas.—This crop which is grown in the lagoons following rice was also produced on a more extensive scale. The area was estimated at 1,500 acres as compared with 1,000 acres the previous year. Yields averaged approximately 1,000 lb. per acre and the price to the producer 5 cents per lb.

Cassava.—Much attention was paid to the preparation and utilization of cassava products particularly by Mr. Alan Pickles, Entomologist, and several lectures on this subject were delivered. Comparatively simple methods of making farine starch, cassava flour, tapioca and cassareep were elucidated. Recommendations for commercial manufacture of cassava products were made to Government, the main product cassava flour, to be blended with all imported wheaten flour on a basis of 15 per cent.

Other Vegetables and Ground Provisions.—Sweet potatoes, yams, tannias and eddoes were all extensively planted and good crops were in prospect at the close of the year.

LIVESTOCK.

38. *Improvement and Development of Livestock.*—A scheme was approved in August for the development of the Trinidad Stock Farm to its utmost capacity as a war emergency measure as well as with a view to post-war needs. Its aim was to increase the output of milk, and breeding stock of cattle, goats, pigs, poultry and rabbits from the Government Stock Farm as rapidly as possible. Five breeding units were stationed in out districts during the year in Trinidad and in Tobago, each unit consisting of a pure-bred Holstein Friesian bull, a Berkshire or Large Black Boar, a Jack Donkey Stallion and a British Alpine, Jumnapari or Anglo Nubian buck goat. In addition to this individual sires including Sahiwals and Zebus, Holstein Friesian, Large Black and Berkshire Boars and buck goats of the three kinds mentioned above stood for service in districts both in Trinidad and in Tobago.

39.—*Milk Supply* :—There has been a great demand for milk due to the increased purchasing power of the general public. Yields declined at one period of the year on account of the shortage of feeding stuffs, particularly protein. This situation together with a shortage of labour, caused three dairies supplying milk to Port-of-Spain to close down, the cows were, however, purchased by other dairies. Experimental trials with the manufacture and use of ensilage by the pit method were undertaken.

40. The dairy goat in the Colony, as the result of the imported British Alpine (Didgmere strain), and Anglo Nubian (Malpas strain), buck goats by Goverment is now taking a prominent part in supplying milk to homes. The dual purpose Jumnapari imported from India continue to do well at the Stock Farm, Trinidad, with intensive management but has been unsuccessful in out districts.

41. Swine Fever was well under control and at the close of the year the disease was confined to one district in the County of St. Patrick. The Island Ward of Tobago continued to be free of the disease and shipped 5,886 pigs to the Trinidad market during the year. Fifty eight young breeding pigs were sold from the Farms in Trinidad and Tobago.

42. *Poultry.*—The number of poultry keepers has continued to increase due to more favourable controlled prices for eggs and poultry. Eighty-eight cockerels were exchanged for common roosters at the Schools in the Colony in order to improve the poultry of the peasantry.

43. The keeping of rabbits as a food production effort during the present emergency is becoming most popular in the Colony : a shipment of Rex Rabbits (Havana and Chinchilla) were received from England.

44. *Control of Slaughtering* —Orders controlling the slaughtering of livestock were brought into force in May and December : these protect immature and breeding stock from being butchered, and control the export of animals from Tobago.

45. *Juvenile Farm Clubs.*—The Juvenile Farm Club movement was started in Trinidad during the year, following the excellent lead given by Tobago, in co-operation with the Education Department and the result was most encouraging. There are now 77 clubs in Trinidad and 37 in Tobago with a membership of 2,357 and 1,206, respectively. A number of shows was held, Government contributing $1,540 as prize money.

EXHIBITIONS.

46. Seven Cane Farmers' and Peasants' Livestock Shows were held after crop in the sugar cane areas in Trinidad and Tobago. In the Land Settlement Competitions, livestock, especially pure-bred pigs and poultry were given as prizes.

47. In March a very successful show was staged by the Trinidad Goat Society in Port-of-Spain.

II.—DEPARTMENTAL INSTITUTIONS, DISTRICT WORK, EXPERIMENTAL WORK AND SPECIALISTS' REPORTS.

DEPARTMENTAL INSTITUTIONS.

Staff.

48. As a result of war conditions the Department continued to suffer a severe shortage of staff in its administrative, technical and clerical branches. The Marketing and Co-operative Officer was seconded for duty with the Food Controller and the Curator on part time duty for supervision of the food production programme on certain sugar estates. The Citrus Agronomist and the Manager, River Estate continued to be engaged almost entirely on the valuation of properties acquired by the United States bases, and the posts of Director of Agriculture and of Agricultural Officer remained unfilled. One Agricultural Officer was seconded as Officer-in-Charge of the Government Stock Farm.

49. Despite this shortage the Department has endeavoured to maintain and develop its work in keeping with war time needs and future agricultural development of the Colony and I wish to gratefully acknowledge the support and help all members of the staff have given me in this work.

River Estate.

50. *Maintenance.*—Mr. R. O'Connor, the Manager, reports that the labour situation throughout the year was much more serious than in 1941 and cultivation was kept only tolerably free of weeds. Such operations as manuring, pruning, supplying, etc., were completely neglected. The labour available was confined chiefly to experiment work in fields Nos. 6, 7, 19, 20, witches' broom experiments, cutlassing of fields and planting of food crops. It was possible to reap only a portion of the cacao crop and much of the lime and the grapefruit crops was lost.

51. *Rainfall.*—The rainfall during the year was exceptionally high and amounted to 86.45 inches as against 62.61 inches in 1941. Up to the end of April the weather was extremely dry and considerable difficulty was caused by an acute water shortage. A new and ample source of water was subsequently connected from the Cascade section of the estate.

52. *Cacao.*—The portion of this crop which was reaped amounted to 143.6 bags of 165 lb. each and disposed of as usual through the Cocoa Planters' Association for a sum of $3,412.22.

53. *Coffee.*—The coffee crop was a very satisfactory one amounting to 15,467 lb. and with much improved prices realized a sum of $1,671.64.

54. *Tonca Beans.*—This crop was fair but the market was weak and continues steadily downwards. The crop of 2,532 lb. was disposed of through the Coconut Growers' Association for $1,186.62.

55. *Food Crops.*—A small plot of yams planted in field No. 18 during 1941 was reaped and the produce utilized as plant material for a one acre field. This will be reaped in February, 1943. During the month of June 5 acres of corn were planted which yielded 78 barrels. The greater part of this was kept for stock-feed and the remainder sold to labourers for food. During the latter part of the year a further 9 acres were planted.

56. A four-acre plot of plantains, with sweet cassava interplanted, was laid down. Only carefully selected plant material was used; the plot received fertilizer and manurial treatment and made particularly fine growth. About half an acre has also been planted with pumpkins.

57. *Fruit.*—Sales of grapefruit, oranges and shaddocks realised $1,350.81, limes $2,401.51, mangoes $274.13 and bananas $379.31.

58. *Stock.*—The stock at the end of the year comprised 2 service bulls, 5 cows, 2 heifers and 5 calves, 4 horses, 3 mules and 1 mule foal.

59. The revenue of the station amounted to $11,966.30 and expenditure $21,316.51.

St. Augustine Nursery.

60. Mr. F. C. Buthn, the Manager, reports that there were raised and distributed from the Nursery 10,498 budded citrus which included 2,030 budded limes, 842 grafted mangoes, 1,690 budded avocadoes, 10,466 seedling limes, 250 cacao seedlings and 33,421 miscellaneous economic and decorative plants. The considerable trade in boxes of seedling vegetables and flower plants which has developed in recent years was confined, almost entirely, to vegetables; 7,000 boxes, or more than 210,000 seedlings were distributed. The work in the vegetable plots was directed largely to the production of seed and other planting material of yams, pigeon peas, corn, beans, spinaches, mustard, patchoi, onions, cucumber and pumpkins for distribution to the public direct and through the Food Controller.

61. The revenue of the Station was $13,251.89 and expenditure $14,060.21.

St. Augustine Experiment Station.

62. *Rainfall.*—In 1942 the rainfall of 72.33 inches was 11.93 inches more than in 1941.

63. *Citrus Experiments.*—Fertilizers were applied to all plots, the treatment being the same as the previous year except for a slight alteration in the standard treatment where Muriate of potash had to be substituted for Sulphate of potash in the second application. The cultivation was cutlassed and roundeared five times, the grass being removed and used for fodder during the months from March to May.

64. Grapefruit disposed of at the Station realised $1,682.02 and oranges $95.15; 2,397 crates of grapefruit sent to the Co-operative Citrus Growers' Association realised $1,438.20 and 234 crates of Valencia oranges $363.48; 653 crates of fruit were distributed free to Government Institutions.

65. *Windbreaks.*—The rows of Pommerac along the traces, planted in 1935, are now well established as a windbreak.

66. *Sugar Cane.*—Plants of the two varieties B.35187 and B.35245 were distributed in June this year. Eleven new varieties were released from the Plant Quarantine Station Five of these were distributed in December, 1942, viz., B.39177, B.39184, B.39200, B.39211 and B.39240. Five varieties were not sufficiently established to send out this year, viz., B.39517, B.39207, B.39220, B 39222, B 39237, and one variety, B.39171 failed to grow. Plants of older varieties were also in demand and further distribution was made of B.3337, B.3439, B.37161, B.37193, B.38155, B.38178, B.38192, B.38212, B.38230, B.38232, B.38233, B.38260, Co.213, Co.219, Co.299, Co.313, Co.321, Co.331, Co.352, Co.360, Co.413, Co.419, Co.432.

67. Multiplication of varieties was again carried out successfully by the method of propagating single-eyed plants in bamboo pots, the total number of plants distributed free being 5,825.

68. The museum block was increased by the addition of the new varieties.

69. *Avocado Pears.*—In the collection of 22 varieties established in small plots, the following have fruited: St. Joseph No. 1, St. Joseph No. 2, St. Joseph No. 3, Winslowson, and Butler.

70. *Pigeon Peas.*—Plots of the varieties Lasiba and Tobago were planted for the usual seed selection.

71. *Maize.*—Plots were planted for seed selection as usual, but owing to labour conditions, the June crop was on a smaller scale than had been planned. In the second planting around October, larger areas were established, from which it is hoped to get the usual quantity of selected seed for next season's planting.

72. *Cassava.*—Plots of the following varieties of cassava were planted:—*Bitter*: Sellier, Parasol, Turkey Claw, and Mama L'Enfant. *Sweet*: Butterstick and Whitestick, and many cuttings were distributed.

73. *Rubber.*—Tapping was undertaken on the small plots of Hevea planted in 1911.

74. The total revenue of the Station was $4,258.07 and expenditure $7,341.89.

Royal Botanic Gardens and Government Grounds.

75. *Maintenance.*—The Curator, Mr. R. E. Dean, reports that regular maintenance was undertaken in the Royal Botanic Gardens and the grounds around Government Buildings in Port-of-Spain, under the control of this Department.

76. *Food Production.*—In addition to the four-acre demonstration food garden laid down in 1940 on the Lady Chancellor Hill slopes, a general scheme of planting foodstuffs in the more frequented parts of the Royal Botanic Gardens was undertaken. A total area of 6¼ acres was planted in crops, comprising corn, cush-cush, dasheen, eddoes, pigeon peas and tannia.

77. The displays of flowering annuals, which in other years formed one of the main attractions of the north-west portion of the Savannah have now given place to the production of vegetables. Thirty beds each measuring 40 feet by 3 feet, were prepared in the main lawn for the purposes of demonstration gardens and a succession of cauliflower, beans, lettuce and khol rabi has been regularly maintained. Large quantities of yams, corn and other foodstuffs were also grown on the lawns of Government House.

78. A demonstration Food Garden was laid out at the Head Office Grounds, St. Clair, and has been cultivated and maintained as a co-operative effort by members of the staff. It afforded an excellent opportunity for practical demonstration to members of the general public, and to the School Teachers taking a special course in agriculture.

79. The vegetative multiplication of cauliflower, variety Early Patna, was satisfactorily employed as a means of propagation. Basal shoots which often arise from mature plants were severed from the parent plants and were transferred immediately to their permanent quarters. Shading of the cuttings during their early stages was found to be advisable, and they were observed to have developed roots in from 7-14 days. During the wet weather cuttings proved more tolerant to heavy rains than would seedlings in their infancy but the average yield per plant was slightly less than that obtained from seedlings.

80. *Rubber Production.*—Regular tapping on alternate days of 84 Hevea rubber trees was commenced at the beginning of the wet season, and the total amount of smoked biscuit and scrap rubber produced and sold to the Rubber Reserve Company to the end of the year was 927 lb., approximately 10½ lb. per tree, and was produced at a cost of 30.7 cents per lb. The single V method of tapping was adopted, later the half spiral system. All the available Castilloa trees in the Royal Botanic Gardens were also tapped. Demonstrations of methods of tapping Hevea and Castilloa were conducted. Particular attention was given to demonstrating the use of inexpensive apparatus in order that small estate owners of Hevea could produce "cured" rubber with a very small outlay of capital. A tapia smoke room was constructed, and a cheap but effective arrangement for the smoking of rolled biscuits was developed successfully.

Development Planting Schemes.

81. *Royal Naval Camp.*—The tree and grass planting programme at the Royal Naval Camp, Port-of-Spain, prepared in consultation with the Public Works Department was commenced at the beginning of the wet season. Due to the high saline content of the soil, considerable difficulties were experienced in establishing a sward. An area of 2¼ acres was levelled for a football pitch with the aid of the Public Works Department, and Savannah grass—*Axonopus compressus*—planted. Growth of this grass has been encouraging but a hard wearing and durable cover has not yet been obtained, due in a large measure to the poor sub-soil drainage in this area. Two lawns have been constructed utilising transported soil, these were first planted in Savannah Grass but replacement of this by *Paspalum vaginatum* in certain sections has been necessary. Trees tolerant to saline conditions were planted, viz., Almond (*Terminalia Catappa*), Coconut Palm and *Parkinsonia aculeata*.

82. *Mon Repos and Navet Housing Schemes.*—In conjunction with the Planning and Housing Commission, street trees, and ornamental group plantings have been undertaken at the San Fernando Housing Estates.

83. *British and Allied Seamen's Quarters and Club.*—The Maintenance of the grounds attached to the British and Allied Seamen's (Officers') Quarters, St. Anns was assumed by this Department or the duration of the War.

Government Stock Farm and Animal Husbandry.

84. *Farm Development.*—Considerable progress was made with the development scheme which aims at an increase in the milk supply as a war measure and accelerating the output of breeding stock for distribution whilst being more self-supporting in the production of feeding stuffs. Poultry runs and laying pens were extended, a rabbitry was started, a tractor purchased, 80 acres of pasture land disc harrowed and graded and 13 acres were ploughed and harrowed in preparation for planting with Uganda grass. Silage pits were dug and filled.

85. A stock of 100,000 lb. of locally grown maize was purchased, dried and stored. Ten acres were planted in ground provisions and vegetables to be sold to the labourers at the Farm.

Cattle.

86. *Murrah Water Buffaloes.*—The two bulls from India stood for service at the Farm and on sugar and coconut estates. The strength of the herd at the end of the year was : 5 bulls (2 imported) 4 cows (2 imported), 1 heifer and 1 heifer calf.

87. *Holstein-Friesians.*—The two pure-bred Holstein bull calves imported from Canada in 1941 have both grown well and stood for service. The three heifers from the same importation have calved down.

88. The two pure-bred bulls from the Carnation Farm, Seattle, Washington, again stood for service at the Farm. Two young pure-bred Holstein bulls by "Sir Inka May 45th", "Jameson" and "Inka Leta May" have developed into fine specimens.

89. Eight grade Holstein bull calves—3 by the Carnation bulls, were sold to the peasantry and all other bull calves were kept for district service, breeding units, &c.

90. *Sussex Cattle.*—"Flambeau, 12" a local pure-bred bull, was sent to the Tobago Farm in May and another local pure-bred bull was kept for service at Valsayn.

91. *Zebu Cattle.*—The Zebu cattle were again maintained in 3 sections: (1) the large herd of pure-bred and Zebu Foundation stock which provides stock for breeding work, milk and beef cattle, (2) the herd of dairy cattle specially selected and handled from birth as dairy cattle, (3) Zebu cows selected for crossing with the Holstein-Friesian bulls in the grade dairy cattle breeding.

92. *Sahiwal or Montgomery Cattle.*—There was no marked improvement in the milk yields of the Sahiwal cows, and they still continue to go dry very soon after calving. Their docility and dairy temperament, however, give encouragement for a hopeful result from this dairy Zebu breed.

93. The strength of the Sahiwals at the end of the year was 4 bulls (2 imported) ; 8 cows (6) imported) ; 4 heifers ; 3 bull calves and 3 heifer calves.

94. *Breeding.*—209 cows and heifers (privately owned) were bred to pure bred and grade bulls.

95. *Milk Yield.*—The Farm produced 37,329 gallons of milk, and 34,505 gallons were supplied to Public Institutions. The milk yield of each cow was recorded daily, and butter-fat tests were made periodically. The range in yield of 5 of the best cows was 5,250-9,250 lb. for their lactation period (250 days.)

96. *Milk Scheme for School Children.*—This Scheme for the supply of milk to school children from Laventille in the north to Cunupia in the south and Maturita R. C. in the east, which was started in 1941 was extended to Cunupia and Tacarigua.

97. *Health.*—Eight cows aborted of one hundred and nineteen which calved as compared with 14 in 1941. Strict preventive measures were again adopted in controlling this condition.

98. The regular monthly dosing of calves with Copper Sulphate was again carried out with satisfactory results in controlling parasitic infestation.

Horse Kind.

99. Thoroughbred Stallions.—Thoroughbred stallions "Bachelor's Tut" (1925) ; "Young Native" (1929) and "Tyrellesse" (1934) stood for service in Trinidad. "Knight of St. Patrick -K. P." (1925) and "Flotsam" (1934) were stationed in Tobago. Thirty mares were bred to the stallions in Trinidad, and 58 in Tobago.

100. *Jack Donkey Stallions.*—Five Jack Donkey Stallions, "Tom Adams", "Emperor 2", "Kentucky" (all imported), "Jackie" (1934), "Trinidad Joe" (1935) were used in the Breeding Units in Trinidad. The young pure-bred Jack Donkey "Trinidad Joe 2" was again used on mares this year.

101. A pure-bred Jack Donkey "Pen" (1936) and a $\frac{3}{4}$ bred Jack were sent over to Tobago. "Prince Shannon" (an imported Jack) also stood for service in Tobago.

Pigs.

102. Owing to Quarantine restrictions still in force due to Swine Fever, outside sows were again not allowed at the Farm for service.

103. Young boars of both breeds (Berkshires and Large Blacks) were again selected for replacing older boars and to increase the number of boars available for the breeding units. Sows of both breeds were also selected to replace old and barren ones, as well as to increase their numbers to double strength.

Goats.

104. The death rate in bucks stationed in Breeding Units and with private individuals was very high. Of the imported British Alpine Bucks, there are now only two alive. The Jumnapari goats kept in good condition under intensive management at Valsayn and Tobago. Three bucks of this breed were stationed in out-districts but failed to stand up to hardier conditions.

Poultry.

105. 4,912 eggs were produced from the three standard breeds White Leghorns, Rhode Island Reds and Barred Plymouth Rocks ; most of these were used for hatching. New Hampshire Reds were purchased locally for development as a dual purpose breed.

106. An experiment was started with the Imperial College of Tropical Agriculture to record the fertility and mortality of eggs of three of the breeds maintained at the Farm-Rhode Island Reds, Barred Plymouth Rocks and White Leghorns—over a period of twelve months. Interesting information is also being obtained at the same time as to the maximum period of storing fertile eggs for incubation under local climatic conditions.

Rabbits.

107. The rearing of rabbits was introduced on the Farm, and some purchases were made from local stock for this purpose. An order has been placed in the U.S.A. for the finest type of Flemish Giants, as it is the intention to rear rabbits on an extensive scale.

Pasturage and Fodder Crops.

108. The pastures were very dry from January to middle of April, when the rains commenced and conditions improved.

109. A nursery of nearly two acres was made with Uganda Grass for replanting existing fodder fields as well as new fields. Five acres were prepared and planted with this grass and irrigated with cattle urine and washing from the main cow shed.

110. Considerable damage was done to the fodder fields by a caterpillar invasion which was widespread in the Colony about the middle of the year.

111. The expenditure of the Farm amounted to $61,423.06 and the revenue to $32,651.88.

DISTRICT WORK.

Duties of District Staff.

112. The activities of the one Agricultural Officer and twelve Agricultural Assistants were mainly directed to Food Advisory work and arranging seed exchanges. More time was available for this work on account of the suspension of the main part of the Cacao Rehabilitation Scheme. Much attention was also paid by these officers to advisory duties on rubber production, but the response from owners of Castilloa trees has not generally come up to expectation. Other duties of the district staff included visits to school gardens, valuations for Government Departments, Land Settlement duties, the supervision of the activities of certain cacao fermentaries, Credit Societies and the Tobago Lime Factory.

113. The Plant Protection staff consisted of a Chief Plant Inspector, two Quarantine Officers and 18 Inspectors. Their main task was the destruction of parasol ants which are a serious pest of agriculture and particularly food crops.

114. A survey of the rubber industry was undertaken in February with their assistance.

Land Settlements.

115. *Acquisition of New Sites.*—Three cacao estates were purchased at a total cost of $38,703.44. Two of these, El Recuerdo at Manzanilla and Las Mercedes at Talparo, were handed over to the Controller of Local Food Production, the other, San Francisco in Lower Couva, was planned for development as a permanent land settlement on leasehold tenure, the layout prepared, and road construction started.

116. *Development.*—The amount spent on the development works on land settlements, during the year, amounted to $70,430.46. The principal works undertaken were the construction of roads on Brooklyn, San Francisco, La Pastora, Alandale and La Tosca ; the provision of a water supply for La Pastora ; the clearance of house sites at Brooklyn and the construction of a house for the Agricultural Assistant at Buenos Ayres.

117. *Housing.*—The Planning and Housing Commission completed 98 houses at Brooklyn and instituted a large building programme at La Pastora where many houses were partially completed in spite of adverse weather conditions. Settlers themselves at their own cost and for their own use erected about 50 houses in other areas.

118. *Production.*—Production of ground provisions, for home consumption and for sale, continue to be the main products grown but in few cases do the settlers depend entirely upon the revenue from the crops grown, as they usually have other employment.

119. The Land Settlement Supervisor reports that settlers are showing a greater interest in the rearing of livestock. A settlement competition was held again this year, prizes being given in the form of plants, livestock and cash.

120. There are four officers, one Supervisor and three Instructors, whose time is entirely devoted to land settlement duties. Two of these officers are now resident on the settlements.

Marketing and Co-operation.

121. The Marketing and Co-operative Officer, Mr. A. E. Trotman was seconded to the Food Controller's Department in April and in that capacity he has been able to implement the proposals he had submitted to Government for improving the marketing of produce in the interest of producers. His duties with regard to Agricultural Co-operative and Credit Societies have been carried on departmentally.

Agricultural Credit Societies.

122. The amount of credit made available by Government for financing agricultural credit societies was $100,000, an increase of $50,000 on the previous year. As a result 16 new societies were registered before the end of the year.

123. There were 76 registered Agricultural Credit Societies of which 58 are in Trinidad and 18 in Tobago ; 20 of those in Trinidad continue to be financed by the Usine Ste. Madeleine Sugar Co., Ltd. The membership of all Societies totalled 2,052. The standard total value of crops, stock, poultry, etc. produced by the members of these societies amounted to $564,856.00. Registration of the Biche Society was cancelled.

124. The Inspector of Agricultural Credit Societies, Mr. Hutchinson, reports that this method of financing small cultivators, apart from being of considerable assistance to them, tends to keep them on the land despite the attractive rates being paid to labourers in the establishment of bases in the Island. On the other hand, cultivators of land who do not belong to Societies, in a number of instances have practically abandoned their holdings.

125. The total amount owed by the societies at the begining of the financial year was $25,140.33. Forty-eight societies received loans during the year totalling $83,765.00 and repayments amounted to $104,638.85. At the end of the year the total owed by all Societies was $7,692.57 and their assets exceeded the liabilities by $32,299.92.

126. Reserve funds of all Societies together totalled $9,468.21.

Agricultural Co-operative Societies.

127. The Tobago Producers' Association in liquidation continued to improve its financial position.

128. The Tobago Limé Growers' Association had a successful season, despite the set-back occasioned by the fire in November, 1941. Temporary arrangements for continuing operations were made and the financial position at the end of the season was satisfactory.

129. The Co-operative Citrus Growers' Association experienced another difficult year. The bulk of the crop was again handled by the canning plant. Members, however, realised 63.8c per crate of fruit after deducting a cess of 15c.

130. Three Co-operative Cacao Fermentaries are operated in Tobago. The crop was poor, amountin to 66 per cent. of the previous year's and members realised an average of $11.50 per fanega.

Government Co-operative Cacao Fermentaries.

131. The Biche Fermentary handled only 1,921 lb. of wet cacao. The Penal Fermentary ceased to function and the buildings were handed over to the Food Control (Marketing Department) in August, 1941, for the purpose of drying and storing peas and maize.

EXPERIMENTAL WORK.

Sugar Agronomy.

132. The Sugar Agronomist, Mr. P. E. Turner, reports on his work during 1942, as follows :—

(1) Field Experiments in Operation.

133. Eleven manurial experiments with plants and four with ratoons, 11 cultural experiments with plants and two with ratoons, and 25 varietal experiments with plants and 11 with ratoons, were harvested on soil types which have been identified and described. The effects of the treatments on varieties on yield of cane and sugar and on crop quality are recorded in detail, with special reference to soil type, in my *Annual Report for* 1942 *on Field Experiments on Sugar Cane in Trinidad*, published by the Sugar Cane Investigation Committee.

134. *Manures.*—The permanent and semi-permanent manurial experiments are concerned primarily with the immediate and residual effects of single dressings of ground limestone, with the effects of dressings of pen manure when applied to successive plant crops, and with the effects of applications of inorganic nitrogen, potash and phosphate to each successive crop. These experiments continue to give information of immediate economic value as to the merits of such manures in dressings of increasing size. Further, they are providing the data necessary for framing the general principles which underly successful manurial treatment of sugar cane under a wide range of soil conditions.

135. The temporary manurial experiments have given useful information on specific soil types as to (*a*) relative value of sulphate of ammonia and nitrate of soda, (*b*) size of dressing of muriate of potash, (*c*) size of dressing and time of application to plants of superphosphate, and differential treatment of plants and ratoons with superphosphate, and (*d*) size of dressing of filter-press mud.

136. *Cultural and Planting Methods.*—Investigations as to method of trimming setts, width of furrow, spacing interval, forking of young plants, and early and late stripping of trash, have given information of direct practical value.

137. *Varieties.*—There have been 31 varieties under comparative test. As a result of the experiments the new variety B.34104 has been recommended for general planting on 11 soil types and the new variety B.3439 on six soil types. A third variety B.3337 is showing outstanding promise.

(2) Soil Surveys.

138. The detailed field-to-field surveys of soil type by Mr. C. F. Charter, with particular reference to the allocation of varieties and to froghopper incidence, have been completed on Orange Grove and Esperanza Estates. The soil types of both Estates have been mapped.

139. Mr. Charter has commenced the accurate mapping on the sugar areas of the main boundary between the soils of the alluvial flats and the soils developed over undulating lands, and of the following subsidiary boundaries-(*a*) the boundary of Frederick Series, (*b*) the boundary between soils developed over recent alluvial silts and those over the various mottled and sandy clays and (*c*) the boundaries of the *Hermitage* and *Tarouba Suites* in the Naparima District. These investigations will provide the essential framework on which subsequent detailed surveys are to be built.

140. A demonstration of contour drainage and ploughing on 28 acres has been made on the undulating lands of one Estate and of contour drainage alone on a larger area.

Cacao Agronomy.

141. The Cacao Agronomist, Dr. F. J. Pound, reports as follows :—

142. During the first six months of the year plans were worked out for the drastic reorganisation of River Estate and Marper Estate and for a revision of cacao investigations as a whole for the Agricultural Policy Committee. August and the greater part of September were spent in Colombia for the purpose of advising the Government of that country on its general agricultural problems.

143. *Expedition to Peru.*—From the end of September Dr. Pound was in the Amazon Valley for the purpose of preparing budded progeny of cacao trees free from witches' broom disease. In 1938 he marked five pickets as being free of the disease in the peninsula between the River Nanay and the Amazon, east of Iquitos. These pickets were re-located and four of them were still free of disease while the fifth showed one infected cherelle. In a detailed search of the hundreds of trees which occurred on this peninsula and on the island south of Iquitos a total of thirty-two large trees were located free of disease while the remainder showed varying degrees of infection - most of them very heavily infected according to Trinidad standards.

144. Budded plants of these thirty-two trees were prepared on stocks previously grown in readiness at Iquitos by the British Consul and three of each clone were brought back by air to Trinidad for trial in the testing nurseries. All arrived in good condition.

145. In addition, four of each clone were planted in a small demonstration block within a few miles of Iquitos so as to serve as a check on the plants brought away. The Peruvian Department of Agriculture is to exchange data with this Department on the behaviour of the trees in the demonstration block.

146. Separate reports on both visits have been prepared.

River Estate.

147. A review of the experiment work of River Estate has shown that many of the experiments have outlived their usefulness and that it is desirable to plan new experiments on a modern basis. In this connection the moving of the Central Cacao Experiment Station to a more representative soil type is under consideration. Certain of the more recently planned experiments have been maintained only with considerable difficulty.

148. New variety trials designed to compare high yielding selections as budded progeny and as cuttings are being conducted in co-operation with the Cacao Research Staff of the Imperial College.

149. The oldest plots were planted in 1937 and have now closed in and are giving an appreciable yield of fruit, sufficient to demonstrate the precocity of some of these selections and certain defects, such as susceptibility to insect attack, in others ; both cuttings and budded plants shape up to form symmetrical trees as they reach their third year.

150. An experiment in Field 22 consists of a block of four self-incompatible types surrounded by a triple ring of self-compatible trees of the same age to discern how far cross pollination can be effective. Fruit has set on the self-incompatible trees in the centre of the field which suggests that pollen is being transferred rather farther than was anticipated and there would thus appear to be little danger in the planting of considerable numbers of good type self-incompatible trees in fields mainly devoted to self-compatible types.

Marper Estate.

151. Labour shortage affected this estate but not as acutely as at River Estate. The plots of introduced trees from South America were maintained during the year and gave an appreciable crop. The cacao from these plots was prepared separately from that of the remainder of the estate on several occasions and was found to be almost identical. If anything, the type was more uniformly purple without the occasional pale beans which are a feature of the normal Trinidad cacao.

152. The older trees were examined for witches' broom which was removed except from heavily infected trees. Some of the clones still proved to be free and were cropping well. Others, as noted for the previous year, were again heavily infected and many were lightly infected.

153. Plots to take the new variety trials were prepared and planted with food crops.

154. The local trees selected for resistance to witches' broom growing as budded clones and seedling blocks reached a stage at which it was possible to select two for the final trials.

155. The frequent clearing of witches' broom infection over the remainder of the estate was modified to one thorough round in the dry season followed by a second removal in October. The loss of pods averaged 6.58 per cent. of the total.

Santa Cruz and King's Bay Propagating Stations.

156. The propagating units were almost completed at La Pastora and much preliminary work done at King's Bay, Tobago.

157. Some 8,000 plants propagated at the St. Augustine Nurseries were planted out to provide cutting material. With a very fortunate prolonged wet season these plants grew well and many will provide cuttings for use in 1943.

158. The total estimated capacity of the Santa Cruz station and the King's Bay station is around 400,000 cuttings per annum, but it will be several years or more before the nurseries can supply this quantity of cuttings. It is anticipated that the first plants for distribution will be ready from Santa Cruz in 1944 and from Tobago in 1945.

Citrus.

159. The Citrus Agronomist continued to be allocated to the Sub-Intendant's Office on full time duties connected with the valuation of the properties acquired for the U.S. Bases. The records of the Citrus Experiments have been maintained and will be analysed as soon as circumstances permit.

MISCELLANEOUS CROP INVESTIGATIONS.

Report by Dr. F. J. Pound.

160. *Adlay.*—Interest in this valuable grain crop has waned and very little Adlay can be found except in the wetter areas of the Colony. A number of small demonstration plots were planted near Rio Claro and all of them yielded quite well.

161. On the whole Adlay gives better returns than maize but difficulties are encountered in hulling. In the pestle and mortar the slippery grain flies out readily. In rice and coffee hullers ungraded grain gives a poor result because only a fraction of the total is hulled. The best procedure in all cases has been found to be to grade the grain before hulling. Then home hulling can be carried out in the moving plate type of corn grinder or good hulling can be obtained from the rice or coffee hullers by adjusting the knives. In the Amazon power-driven rice and coffee hullers have been used with considerable success with Adlay. A set of small hand hullers and sieves for grading has been on demonstration at Rio Claro during the year.

162. *Salt Tolerant Rice.*—The small samples of fresh seed obtained in 1941 from plants grown in tubs and irrigated with sea water of varying concentrations were grown in 1942 in plots measuring 10 ft. by 10 ft. in which water could be controlled. The seeds were germinated in fresh water beds as is the practice in countries where salt tolerant rice is grown in quantity. Once grown to two or more inches salt solutions commencing at 5 per cent. sea water and rising gradually to 50 per cent. in a period of about two weeks were used for irrigating the plots. Yields varied considerably. Some types as before gave little good grain. The lowest yield was ½ lb. paddy in the plot, the highest yield 6½ lb.

163. *Rice Variety Tests.*—For two consecutive seasons a simple randomised block variety trial of ten varieties of swamp rice has been carried out both at Bejucal and Debe, the two main centres of rice growing in the Colony. As with efforts to establish salt tolerant varieties and to carry out fertilizer experiments on private rice lands irregularities of water supply added difficulties to the project. During the 1942 season excess water carried away the bulk of the nurseries at Debe, making impossible the planting of more than 3 replicates. A dry spell later also did damage. At Bejucal, in both seasons a liberal dressing of pen manure was puddled into the beds before planting since excellent results had followed this treatment in earlier experiments.

164. The varieties tested were :—Joya, Kalayaman, Badgerbung, Demerara, Sorrow, Local Red, Chittagong, D. 114, D. 79 and Demerara Creole. All varieties yielded between 3,400 and 3,800 lb. paddy per acre except D. 79 which gave 3,100 and Chittagong 2,500 lb. At Debe owing to failure of the water supply the yields in 1942 were less than half of those recorded in 1941 when yields of all varieties were from 3,000 to 3,500 lb. per acre.

165. *Soya Beans.*—During recent years efforts have been made to establish Soya Beans both as a crop for table use and as an oil crop. The variety " Venezuelan" has been long established on a small scale and grows in certain districts very well. In 1941 the variety " Otootan " principally a hay type was also established. Promising culinary types introduced at the same time failed to make headway in the trials. In 1942, 400 lb. of " Otootan " and 100 lb. of different edible varieties were imported for seed purposes and distributed to various districts for planting. Very poor results were obtained with the edible types but the " Otootan " yielded well where planted in dry areas and cultivated properly. It appears that the soya bean is not a suitable crop for the wetter areas of Trinidad unless the crop can be sown late in the wet season to ripen in the dry weather of January or February.

SPECIALIST REPORTS.

Plant Pests.

166. The Entomologist, Mr. A. Pickles, reports that a severe dry season was followed, as was to be expected, by extremely severe outbreaks of pest insects soon after the opening of the rainy season. The problem of control of the outbreaks was complicated by extreme scarcity of insecticidal material and equipment, of which supplies were not obtainable until much damage had been done. By arrangement with the Food Controller, a stock of insecticides for sale through his organisation has now been obtained for the benefit of small-holders.

167. *Sugar Cane.*—Sugar Cane suffered severely from froghopper attack and the area of estates cane injured amounted to some 8,500 acres. It is probable that the area affected would have been smaller had the ploughing programme not been curtailed on account of labour shortage. It is estimated that froghopper injury will reduce the 1943 crop by about 112,000 tons of cane, the loss of estates canes being 87,000 tons and of farmers' canes 25,000 tons.

168. Cane fields were also attacked with extreme severity by defoliating caterpillars, especially *Laphygma frugiperda* and *Mocis repanda* ; 5,000 acres were affected and the loss is estimated at 35,000 tons of cane.

169. These insects, also caused severe injury to maize in several parts of the Colony. Dusting with lead arsenate was generally attended with good results, but the supply of lead arsenate was limited and only a fraction of the areas affected could be treated.

170. Market garden crops in some localities were also destroyed on a large scale by cutworms of numerous species; the most serious damage occurred at Pointe-a-Pierre, where several acres of beetroot, carrots, sweet potatoes and other vegetables were completely destroyed.

Plant Diseases.

171. The Plant Pathologist, Mr. C. A. Thorold, reports that there were no new or serious outbreaks of disease.

172. *Witches' Broom Disease of Cacao.*—The large-scale experiments on the control of Witches' broom disease, commenced in 1941 on behalf of the Cacao Board, have been repeated in the 1942/43 season. These experiments which have been carried out at two estates have shown that no effective control of Witches' broom disease has been achieved by this direct method of removing brooms on areas of 25, 40 and 80 acres.

173. In order to test the possibility of controlling Witches' broom disease by fungicides, monthly sprayings and observations were carried out at River during the years 1940 and 1941. There appeared to be some reduction in the number of brooms on young cacao sprayed frequently with Bordeaux mixture, and partial control of pod infection associated with the monthly spraying of older trees. It was considered that the results were not sufficiently encouraging to warrant further trials of this control method, which seemed unlikely to be economically advantageous under present conditions.

174. A special inspection of the north coast area of Tobago was made in September but no Witches' broom was found there. Elsewhere in Tobago the incidence of brooms remained at a relatively low level compared with Trinidad, pod infection was negligible and no new areas infected with Witches' Broom disease were found.

175. *Citrus Scab.*—Scab disease has not been severe in the grapefruit plantations where it occurred previously. This disease was not reported from any new areas.

176. *Sugar Cane Mosaic.*—Mosaic inspections have been continued and it is satisfactory to note that the disease remains at the previous low level.

177. *Moko Disease of* I.C.2. *Banana.*—The I.C.2 banana is very susceptible to Moko disease and severe attacks had caused experiment plots to be abandoned at Tamana and Grande Riviere. Accordingly, a ½ acre plot of I.C.2 was established at Montevideo Estate, which has produced 82 bunches in its first year. No cases of Moko disease have yet occurred in this new planting.

178. *Diseases of Food Crops.*—The increase in both area and interest devoted to food crops has brought certain vegetable diseases into prominence. Bacterial wilt disease continued to be the limiting factor in tomato production, at least during the wetter months. The bacterial rot affecting cauliflower and cabbage was severe in some places during the rains. Later in the year, a bacterial wilt of ochro caused some losses in the neighbourhood of St. Augustine. A severe leaf spotting of carrots, associated with *Macrosporum carotae* occurred in at least two widely separated localities. It was claimed that this disease was controlled effectively by two sprayings with Bordeaux mixture at intervals of ten days.

179. Small-scale trials of methods for pre-storage treatment of sweet potatoes were undertaken at the Picton Estate of the Usine Ste. Madeleine Company through the kind assistance and generous co-operation of the Field Superintendent and Estate Manager.

180. After a storage period of five months, the losses in weight were less for the cases where the potatoes had been 'cured' for periods of one to five days in heaps covered with wet grass in the open, as compared with heaps 'cured' in the shade or without any pre-storage treatment, where loss in weight was generally greater.

Soil Survey.

181. The Soil Chemist, Dr. E. M. Chenery, reports that the Soil Survey of the Northern Basin of Trinidad (not including sugar cane land nor the Caroni Swamp) was completed and the Central Range practically completed. The area covered was approximately 100 square miles including both alienated and Crown Forest Lands. Detailed soil surveys were undertaken of Las Mercedes and San Francisco Estates for the purpose of deciding as to their suitability for Land Settlements; River Estate and Government Farm, Tobago, in connection with the reorganisation schemes under consideration; lands at Pointe-a-Pierre and numerous other places for food production and San Juan Estate, Couva, where important Cacao work is being undertaken.

182. About 200 soil profile sheets of data collected in the last six years from the Northern Basin and Central Range were prepared for permanent record. The soil map of an area covered by 16 Ward Sheets were re-drawn to the scale of 25,000 and coloured. Large scale maps of the estates referred to above were also drawn and coloured. A comprehensive report was written on the soil and herbage of the Government Farm, Tobago.

183. Accommodation for a new soil laboratory was provided at the Head Office of the Department of Agriculture in November. Scale plans of the layout and fittings were drawn up and the constructional work was well under way by the end of the year.

Veterinary.

184. The Senior Veterinary Officer, Captain H. V. M. Metivier, O.B.E., reports as follows:—

Proclaimed Diseases.

185. *Anthrax.*—A report of a sporadic case was made in August, but on investigation it proved to be negative.

186. *Swine Fever.*—The position with regard to this disease improved considerably: the counties of St. George and Caroni were free for the whole year and at its close only one county, St. Patrick, remained affected in the district of Icacos. It was decided to postpone the adoption of vaccination with killed virus on account of the good results obtained from the slaughter policy. The situation since the outbreak started in 1941 (June) may be summarised as follows:—

Period	*Counties affected*	*Pigs destroyed*	*Compensation paid* $
June-Dec. 1941 ...	...St. George, Caroni, Victoria, St. Patrick ...	1,541	11,927
Jan.-June 1942 ...	...Victoria, St. Patrick, Mayaro	180	1,530
July-Dec. 1942 ...	...St. Patrick, Mayaro	107	752

187. Quarantine restrictions were enforced against Barbados, Grenada, Carriacou and St. Lucia where this disease existed.

188. *Paralytic Rabies (Bat-transmitted).*—The Colony was again free from this disease: bat destruction was carried out by the Health Department and 621 bats including 486 *Desmodus*, were examined by the Government Bacteriologist but none showed the presence of Negri bodies.

189. *Rabies (Ordinary).*—A human case of Rabies occurred in Roxborough, Tobago - following the bite of a cat about a month previously: the cat was subsequently destroyed by a dog which was subsequently placed in quarantine at the Tobago Farm. Regulations were at once brought into force restricting the movements of canine and feline animals in and out of Tobago; a muzzling order was enforced in all areas 10 miles around the town of Roxborough. No further cases were reported at the end of the year.

190. Twenty-three dogs and one Tiger Cat imported from countries other than Great Britain and Northern Ireland were brought into the Colony during the year and quarantined. 211 stray dogs were caught by the Police Department and destroyed.

191. *Equine Encephalomyelitis.*—Due to the removal of quarantine restrictions, 146 horses 33 mules and 63 donkeys were imported from Venezuela: there were no cases of this disease in the Colony.

192. *Tuberculosis.*—The routine testing of dairy cattle was carried out in the rural districts supplying milk to Port-of-Spain and Scarborough both among the peasantry and the large dairy herds. There were 40 reactors in 1,400 animals tested. At the abattoirs 2 cases were reported.

193. *Foot and Mouth Disease.*—Owing to an outbreak in British Guiana the importation of animals from all the Guianas was prohibited during the year.

Non-Proclaimed Diseases.

194. *Parasitic Gastritis.*—Ruminants, especially calves, suffered considerably during the rainy season: this was due to the fact that with the shortages of concentrates their resistance was lowered and the parasites got the upper hand. Copper sulphate treatment was used and the condition improved as soon as feeding became available.

195. *Pneumonia in Calves.*—The condition was prevalent in the large dairies and success was obtained by improved sanitary methods and the use of Sulphanilamide preparations.

196. *Contagious Abortion.*—Even in the large dairies the incidence of the disease fell and control measures were after confined to isolating affected animals for 2 months and keeping all calving cows in their pens for 21 days after calving.

197. *Strangles and influenza.*—The incidence of strangles and influenza in horsekind was low during the year, but a few cases of strangles occurred in young racing stock and on some sugar estates.

Inspection of Animals.

198. Animals imported into the Colony were inspected as usual and the following were examined: Horses 173, Mules 35, Donkeys 70, Cattle 20,500, Pigs 3,034, Sheep 2,478, Goats 6,369, Dogs 23 and Cats 2. The number of cattle imported was 100 per cent. more than in previous years, due to the fact that very little cold storage meat was brought into the Colony from South America and more live cattle were imported from Venezuela.

Quarantine Station.

199. The number of animals admitted to the Quarantine Stations was as follows:—Cattle 20,195, Horses 173, Mules 33, Donkeys 65, Pigs 32, Goats 30, Dogs 23, Cats 1; 555 cattle were vaccinated against Anthrax and 43 tuberculin tested.

Research in Animal Husbandry.

200. In co-operation with the Professor of Agriculture of the Imperial College of Tropical Agriculture, work was carried out on artificial insemination and other breeding problems of cattle and poultry.

IMPERIAL COLLEGE OF TROPICAL AGRICULTURE.

201. The Department is again indebted to the Principal and staff of the Imperial College of Tropical Agriculture for their co-operation and assistance.

VISITS OF COMPTROLLER FOR DEVELOPMENT AND WELFARE AND THE INSPECTOR GENERAL OF AGRICULTURE.

202. The Comptroller for Development and Welfare and the Inspector General of Agriculture paid several visits to the Colony.

PUBLICATIONS.

Field Experiments on Sugar Cane in Trinidad (with A Tentative Grouping of Trinidad Sugar Cane Soils on the Basis of their Moisture Relationships by C. F. Charter). Annual Report for 1942. P. E. Turner.

List of Cultural, Manurial and Varietal Experiments on Sugar Cane in Trinidad in 1942, (Sugar Cane Investigation Committee). P. E. Turner.

The Food Production Effort of Trinidad and Tobago. Agricultural Society Paper, No. 843, August, 1942 - R. O. Williams.

What to do in your Garden.—R. O. Williams.

Tapping of Castilloa. (Proceedings of the Agricultural Society, 42, Part 4, pp. 277-283). R. O. Williams.

Rabbits for Food and Profit in Trinidad and Tobago. J. L. Shannon.

A Few Practical Suggestions on Poultry Keeping in Trinidad and Tobago. J. L. Shannon.

The Value of Livestock in Food Production. H. V. M. Metivier.

Correspondence on the Subject of Agriculture between the Government of Trinidad and Tobago and the Comptroller for Development and Welfare, B.W.I.—*Council Paper, No.* 23 *of* 1942. A. J. Wakefield.

Insect Pests of Vegetable Gardens. A. Pickles.

Cassava in the Amazon Valley. (Proceedings of the Agricultural Society, 42, Part 2, *pp.* 141-149). A. Pickles.

The Major Pests of Food Crops and their Control. (Proceedings of the Agricultural Society, 42, Part 3, *pp.* 187-203). A. Pickles.

Agricultural Legislation.

203. The following Ordinances, Regulations, Orders and Proclamations affecting agriculture, came into force during the year:—

Cacao Industry Suspension Ordinance, 1942.
Limes Export Levy Ordinance, 1942.
Diseases of Animals (Amendment) Ordinance, 1942.
Land Acquisition (Amendment) Ordinance, 1942.
Agricultural Fires (Amendment) Ordinance, 1942.
Sale of Produce (Amendment) Ordinance, 1942.
Cane Farming Control (Amendment) Ordinance, 1942.
Irrigation Ordinance, 1942.
Defence (Offences relating to Crops) Regulations, 1942.
Defence (Rubber Production and Control) Regulations, 1942.
Defence (Offences relating to Animals) Regulations, 1942.
Defence (Rubber Production and Control Amendment) Regulations, 1942.
Control of Certain Veterinary Articles Regulations, 1942.
Plant Protection (Amendment) Regulations, 1942.
Slaughtering of Livestock Order, 1942.
Slaughtering of Livestock (No. 2) Order, 1942.
Sugar Manufacturers Returns Order, 1942.
Sugar Quotas Amendment Order, 1942.
Muzzling of Dogs in the Island of Tobago. (Proclamation No. 64 of 1942.)

9th June, 1943.

R. O. WILLIAMS,
Acting Director of Agriculture.